User Guide

Fiber Optic Extenders

FOX USB Extender

Fiber Optic Extender for USB Peripherals

Extron® Electronics

INTERFACING, SWITCHING AND CONTROL

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07 12

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference; the user must correct the interference at his own expense.

NOTE: This unit was tested with shielded I/O cables on the peripheral devices. Shielded cables must be used to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the "**Extron Safety and Regulatory Compliance Guide**" on the Extron website.

Conventions Used in this Guide

Notifications

WARNING: A warning indicates a situation that has the potential to result in death or severe injury.

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

NOTE: A note draws attention to important information.

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Introduction

WARNING: The FOX USB Extender Transmitter and Receiver units output continuous invisible light, which may be harmful to the eyes; use with caution.

- ***Do not look*** into the rear panel fiber optic cable connectors or into the fiber optic cables themselves.
- Plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

- About this Guide
- About the FOX USB Extender
- Features

About this Guide

This guide contains information to install, configure, and operate the Extron Electronics FOX USB Extender.

About the FOX USB Extender

The FOX USB Extender (see figure **1**, on the next page) is a USB transmitter and receiver pair that extends the usable distance of USB 1.0, 1.1, and 2.0 standards with data transfer rates up to 480 Mbps. The Extender is also compatible with the Extron FOX Matrix Switcher models (see figure **2**, on the next page).

The transmitter and receiver are categorized by the type of fiber optic cable, multimode or singlemode, which define the effective range of transmission:

- **Multimode** — Long distance, up to 2 km (1.2 miles) (depending on the fiber cable)
- **Singlemode** — Very long distance, up to 30 km (18.75 miles)

NOTE: The multimode and singlemode units are physically and functionally identical, with the exception of the effective range of transmission. In this manual, any reference applies to either transmission mode model unless otherwise specified.

A FOX USB Extender system consists of a transmitter (Tx) and a receiver (Rx). The transmitter connects directly to a USB port on a PC or USB host. The receiver features a four port USB hub to connect multiple peripheral devices.

The FOX USB Extender complies with the USB 2.0 standard, supporting USB 2.0 (480 Mbps high speed), USB 1.1 (12 Mbps full speed), and USB 1.0 (1.5 Mbps low speed) for data transmission throughout the system. It also supplies +5 VDC (up to 500 mA) of power on each of the receiver USB peripheral ports.

The transmitter and receiver both feature a front panel USB host activity LED, power indicator, and a fiber cable Link LED for local or remote troubleshooting.

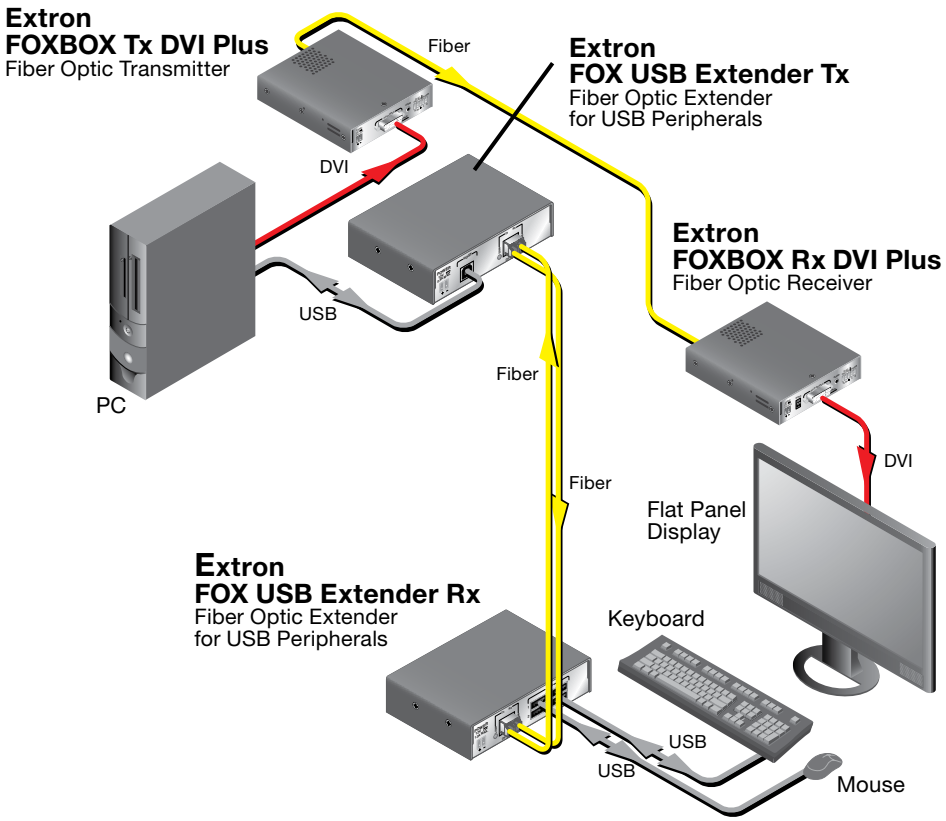


Figure 1. Typical FOX USB Transmitter and Receiver Application

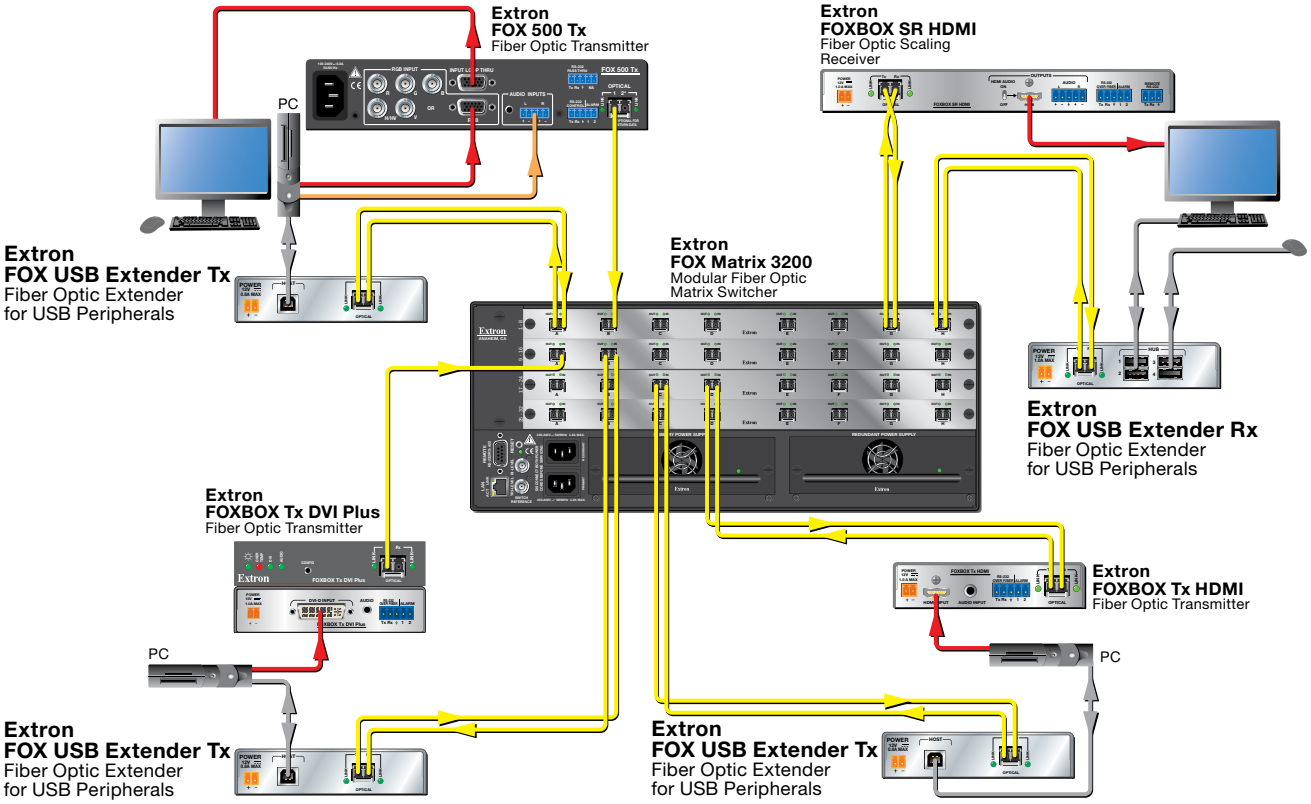


Figure 2. Typical FOX USB Transmitter and Receiver Application with Matrix Switcher

The FOX USB Extenders are in 3 inches deep, quarter rack width, 1 inch high metal enclosures. They can be set on a tabletop or mounted in a rack, behind a display, under or through furniture, or to a projector pole.

Features

- **Transmits USB signals long distances over two fiber optic cables —** Up to 30 km (18.75 miles) on singlemode cables.
- **One inch high, quarter rack width, metal enclosures —** With low profile enclosures, the transmitter and receiver can be discreetly installed in locations such as behind a plasma or LCD flat-panel display.
- **External 100 VAC to 240 VAC, 50-60 Hz, international power supply —** Included with each transmitter and receiver.

Installation and Operation

This sections details the installation of the FOX USB Extender, including:

- **Mounting Overview**
- **Connections**
- **System Startup and Operation**
- **Troubleshooting**

Mounting Overview

The 3 inches deep, 1 inch high, quarter rack width FOX USB Extender transmitter and receiver can be placed on a tabletop, behind a display, mounted on a rack shelf, or mounted under a desk or tabletop. The receiver can be mounted on a projector bracket.

Mounting details are included in "**Mounting the FOX USB Extender**" in the "Reference Information" section on page 12. Mounting instructions are included with each optional mounting kit.

ATTENTION: Installation and service must be performed by authorized personnel only.

Connections

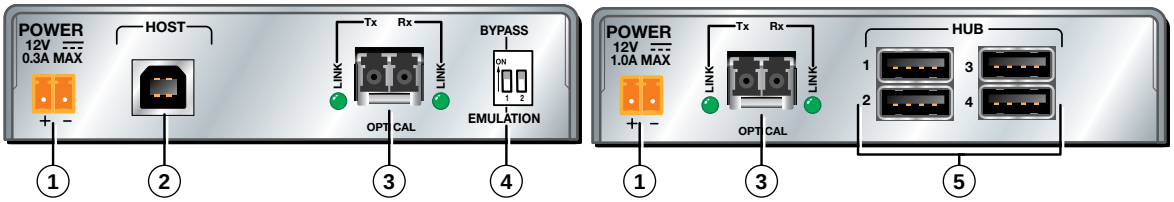


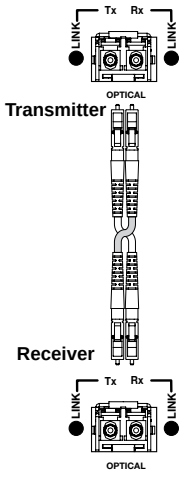
Figure 3. Rear Panel Connectors

① **Power input connector** — Connect external power supplies to these 2-pole, 3.5 mm captive screw connectors. If the USB port of a connected PC or laptop is capable of providing USB power, an external supply for the transmitter is not required.

ATTENTIONS:
- Always use a power supply supplied by or specified by Extron for use with the FOX USB Extender Series. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the FOX USB Extenders.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron AV processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium or desk.
- The installation must always be in accordance with applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.

② **USB host connector** — This USB Type A connector supports a computer host. **Do not connect a device at this time**; see "Startup" on page 7.

③ **Fiber optic connectors and LEDs** — Connect two fiber optic cables between the LC connectors on the transmitter and receiver. Connect each Tx port to the Rx port on the opposite unit (see the drawing at right).



WARNING: These units output continuous invisible light, which may be harmful to the eyes; use with caution. For additional safety, plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

NOTE: Use the proper fiber cable for your transmitter and receiver pair. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.

Tx Link and Rx Link LEDs — When lit, the link is active (light is present, either transmitted or received).

④ **DIP Switch** —

Emulation (down) position — Enables the peripheral emulation, which is internal to the transmitter. This emulation allows connected hosts, some of which require a connected USB device, to boot up normally.

Bypass (up) position — Bypasses the internal peripheral emulation of the transmitter.

NOTES:
- The FOX USB Extender system supports up to four USB hubs connected to the receiver when the DIP switch on the transmitter is in the Bypass position. The system supports up to three hubs when the DIP switch is in the Emulation position.
- DIP switch 2 has no function.

⑤ **Hub connectors** — These female USB Type A connectors support up to four USB devices. **Do not connect devices at this time**; see "Startup" on the next page.

The connections are USB 2.0 compatible, and can provide +5 VDC at up to 500 mA to connected USB peripherals requiring power.

System Startup and Operation

Indications

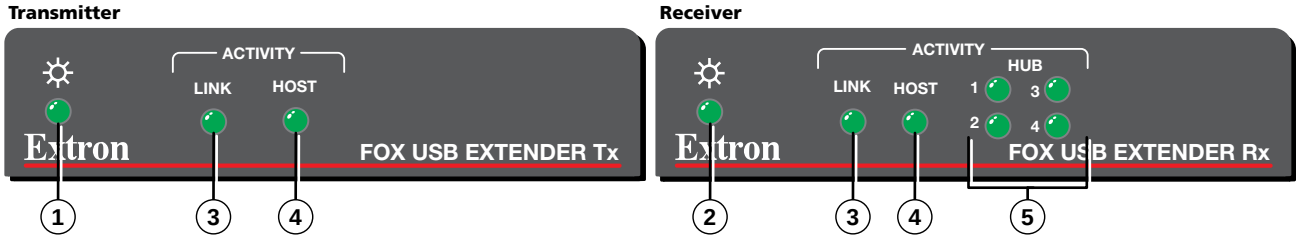


Figure 4. Front Panel Indications

① **Power LED (transmitter)** — Indicates that the transmitter is receiving power from an external power supply.

② **Power LED (receiver)** — Indicates that the receiver is receiving power from an external power supply.

③ **Link LED** — Indicates that the unit is receiving light on its rear panel Rx connector.

NOTE: The receiver Link LED indicates light from the transmitter. The transmitter Link LED indicates light from the receiver.

④ **Host LED** — Indicates that the Extender is communicating with the computer connected to the rear panel Host port on the transmitter.

⑤ **Hub LEDs** — Indicate that the receiver is communicating with the USB peripheral connected to the rear panel Hub port on the receiver.

Startup

For proper operation, the transmitter, receiver, USB host, and peripherals must be connected properly as shown in figure **5** and in the sequence described below.

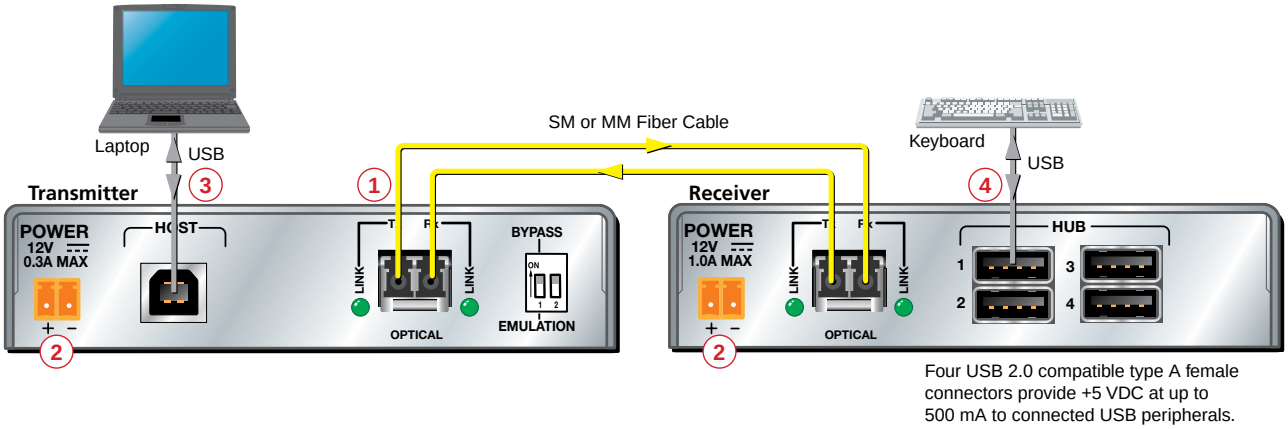


Figure 5. FOX USB Extender Connection Guide with Two External Supplies

1. Power down the transmitter, receiver, USB host computer (connected to the transmitter) and all peripherals and devices that will be connected to the receiver.
2. Connect fiber cables between the transmitter and receiver (① on figure **5**).
3. Connect external power supplies to the transmitter and receiver and apply power (②).

   The Power LEDs and Link LEDs on both units light to indicate proper link cable connection between the transmitter and receiver.

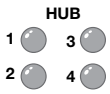
4. Connect a type A-B cable between the FOX USB Extender transmitter Host port and the USB host (a computer or other USB host device) (③).
5. Apply power to the host computer and boot the computer.

   After the computer starts, the transmitter Host LED lights, indicating communication between the PC and transmitter hub controller.

   Shortly after, the receiver Host LED lights indicating communication between the transmitter and receiver.

6. Connect USB peripherals, such as keyboards and mice, to the FOX USB Extender receiver using USB 2.0 compatible cables (④).

   As each peripheral is recognized by the PC, the appropriate FOX USB Extender Hub LED on the front panel of the receiver lights.

Operation

No drivers are required for a host to function with the FOX USB Extenders. The transmitter is detected by Windows and appropriate USB drivers are loaded. Certain USB peripherals, such as gaming keyboards, USB interactive whiteboards, scanners, printers, and similar devices, require specific drivers to be installed on the host computer. See the USB device installation instructions or the peripheral manufacturer website to obtain drivers.

After the transmitter, the receiver, the USB host, and the peripherals are connected and powered up, and the appropriate drivers are loaded for the peripherals, the system is fully operational. If any problems are encountered, verify that the cables are routed and connected properly and the latest drivers for each peripheral are installed.

Troubleshooting

USB signals are generally reliable but are susceptible to bad connections or cables that are too long. To avoid the loss of data and communications, follow these guidelines:

- The transmitter host USB cable and receiver hub port USB cables should not exceed 10 feet (3 m).
- Avoid or limit the use of adapters.
- The FOX USB Extender works as described in point-to-point applications. Do not use additional adapters, patch panels, or couplers with the host USB cables, hub USB cables, or fiber optic cables. Additional links in the signal chain can result in the reduction of signal integrity and overall cable length performance.

When properly connected and operating, both transmitter and receiver Power LEDs, Link LEDs and Host LEDs are lit. The Hub LED for each connected peripheral recognized by the host PC is also lit.

Front panel LEDs may also be useful for troubleshooting. The table on the next page outlines operating details indicated by the LEDs.

Table 1. System Troubleshooting

	Transmitter		Receiver	
LED	**Lit**	**Unlit**	**Lit**	**Unlit**
☼	The 12 VDC supply is connected and operating properly or the host is properly supplying power.	The 12 VDC supply is not connected or is defective. If a transmitter supply is not being used, the USB host is either not on or not providing power, or the USB cable is disconnected.	The 12 VDC supply is connected and operating properly.	The 12 VDC supply is not connected or defective.
Link	Both the transmitter and receiver have power and the fiber optic cables are connected properly. (The transmitter Link LED indicates light from the receiver.)	If both Power LEDs are on, the fiber optic cable is not connected. If a transmitter supply is not being used, the USB host is either not on or is not providing power.	Both the transmitter and receiver have power and the fiber optic cables are connected properly. (The receiver Link LED indicates light from the transmitter.)	If both Power LEDs are on, the fiber optic cables are not connected or are improperly wired. If either Power LED is off, see the Power LED troubleshooting instructions above.
Host	When the transmitter Host LED is on, the transmitter is communicating with the host computer.	If the transmitter Host LED is on, the USB cable is not connected. The LED blinks if the transmitter is not communicating with the receiver.	Lights when communication with the host computer is established.	The host USB port is not connected or the host is not communicating.
Hub	**N/A**	**N/A**	Lights when the peripheral on the USB port has been recognized by the host computer.	The peripheral on the USB port has not been recognized or is improperly connected.

If your problems persist, call the Extron S3 Sales & Technical Support Hotline. See the contact numbers on the **last page** of this guide for the Extron office nearest you

Reference Information

This section provides the specifications, part numbers, and accessories, and mounting instructions for the FOX USB Extender. Topics that are covered include:

- **Specifications**
- **Part Numbers**
- **Mounting the FOX USB Extender**

Specifications

USB

USB standards	USB 2.0, USB 1.1, USB 1.0 compatible
USB data rates	Low speed (1.5 Mbps), full speed (12 Mbps), high speed (480 Mbps)
Signal transmission distance	30 km (18.64 miles) with singlemode (SM) cables 300 m (985') with 62.5 µm OM1 multimode (MM) cables 1 km (3280') with 50 µm OM2 multimode (MM) cables 2 km (6561') with 50 µm OM3/OM4 2000 MHz bandwidth laser optimized multimode cables

NOTE: Operating distance is approximate. These are typical maximum distances that may vary depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

USB host — FOX USB Extender Tx

Number/signal type	1 USB (supports USB 2.0, 1.1, 1.0 speeds)
Connectors	1 female USB type B

Interconnection between transmitter and receiver

Connectors	2 LC connectors
Nominal peak wavelength	850 nm for MM, 1310 nm for SM
Data rate	600 Mbps
Transmission power	-5 dBm, typical
Maximum receiver sensitivity	
Singlemode	-18 dBm, typical
Multimode	-12 dBm, typical
Optical loss budget	
Singlemode	13 dB, maximum
Multimode	7 dB, maximum

USB hub — FOX USB Extender Rx

Number/signal type	(1) 4-port USB hub
Connectors	4 female USB type A

General

Power supply	External Input: 100-240 VAC, 50-60 Hz Output: 12 VDC, 1 A, 12 watts
Power consumption	
Device	
FOX USB Extender Tx	2.6 watts
FOX USB Extender Rx	11.5 watts
Device and power supply	
FOX USB Extender Tx	3.4 watts
FOX USB Extender Rx	13.9 watts
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, vents on top and sides
Thermal dissipation	
Device	
FOX USB Extender Tx	8.8 BTU/hr
FOX USB Extender Rx	10.1 BTU/hr
Device and power supply	
FOX USB Extender Tx	11.4 BTU/hr
FOX USB Extender Rx	18.3 BTU/hr
Mounting	
Rack mount	Yes, with optional rack shelf or rack mounting brackets
Furniture or wall mount	Yes, with optional mounting kits
Enclosure type	Metal
Enclosure dimensions	1.0" H x 4.3" W x 3.0" D (2.5 cm H x 10.9 cm W x 7.6 cm D) (Depth excludes connectors.)
Product weight	0.25 lbs (0.1 kg)
Shipping weight	1 lb (<1 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI Class A
Environmental	Complies with the appropriate requirements of RoHS, WEEE
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTES:
- All nominal levels are at ±10%.
- Specifications are subject to change without notice.

Part Numbers

FOX USB Extender Part Numbers

Extender part numbers	Part number
FOX USB Tx (SM)	60-1234-12
FOX USB Rx (SM)	60-1234-22
FOX USB Tx (MM)	60-1234-11
FOX USB Rx (MM)	60-1234-21

Included Parts

These items are included in each order for a FOX USB Extender transmitter or receiver:

Included part numbers	Part number
12V, 1A external power supply	
IEC power cords (qty. 1)	
SFP Module (SM or MM, depending on the model)	
10' LC-LC duplex patch cable (SM or MM, depending on the model)	
Rubber feet (qty. 4)	
FOX USB Extender Setup Guide	

Cables

Fiber cable assemblies

MHR Mini High Resolution Cable	Part Number
4LC MM LC to LC Multimode Fiber Optic Cable Assemblies	26-652-*nn*
2LC OM4 MM P LC to LC Laser-Optimized Multimode Fiber Optic Cable Assemblies — Plenum	26-671-*nn*
2LC SM P LC to LC Bend-Insensitive Singlemode Fiber Optic Cable Assemblies — Plenum	26-670-*nn*

Bulk fiber cable and termination tools

RG6 Super High Resolution Cable	Part Number
OM4 MM P/2K Plenum 2 km (6,562 foot) Spool	22-225-02
SM P/2K Plenum 2 km (6,562 foot) Spool	22-223-02
Fiber Optic Termination Kit Termination Kit	100-656-01
QLC MM/10 Fiber Optic connectors, multimode, qty. 10	101-018-01
QLC SM/10 Fiber Optic connectors, singlemode, qty. 10	101-017-01

Mounting the FOX USB Extender

ATTENTION: Installation and service must be performed by authorized personnel only.

Any of the units can be placed on a tabletop or behind a display, mounted on a rack shelf, or mounted under or through a desk or other furniture. The receiver can be mounted to a projector bracket.

Tabletop Use

Affix the four included rubber feet to the bottom of the unit and place it in any convenient location.

Mounting

If desired, mount the unit using any of the following optional kits:

- RSF 123 3.5-inch deep rack shelf kit (part number **60-190-20**)
- RSB 123 3.5-inch deep rack shelf (part number **60-604-21**)
- RSU 126 6-inch deep universal rack shelf kit (part number **60-190-10**)
- RSB 126 6-inch deep basic rack shelf (part number **60-604-11**)
- RSU 129 9.5-inch deep universal rack shelf kit (part number **60-190-01**)
- RSB 129 9.5-inch deep basic rack shelf (part number **60-604-02**)
- MBB 100 Back of the rack mounting kit (part number **70-367-01**)
- MBU 125 under-desk mounting kit (part number **70-077-01**)
- MBD 129 through-desk mounting kit (part number **70-077-02**)
- PMK 300 projector mount kit (part number **70-374-01**)
- PMK 350 low profile projector mount kit (part number **70-563-03**)

Follow the instructions included with the kit.

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines pertain to the installation of a FOX USB Extender unit into a rack.

1. **Elevated operating ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by Extron (Tma = +122 °F [+50 °C]).
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876
Europe: 31.33.453.4040
Asia: 65.6383.4400
Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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